Cardiovascular Research and Tissue Engineering Summer School

The goal of a “**Cardiovascular Research Cardiovascular Research and Tissue Engineering Summer School”** is to provide students, early-career researchers, or healthcare professionals with an immersive educational experience focused on cardiovascular health, research methods, and the latest innovations in the field. The summer school aims to:

1. **Educate participants** about the fundamental principles of cardiovascular biology and disease.
2. **Introduce current research methodologies** and technologies used in cardiovascular research, including clinical trials, imaging techniques, and molecular biology.
3. **Provide networking opportunities** with experts in cardiovascular science and foster collaborations.
4. **Offer hands-on experiences**, including laboratory demonstrations, workshops, and data analysis.
5. **Expose participants to the latest research findings** in cardiovascular medicine and highlight their real-world applications.

Date: 13.07-17.07.2026

Day 1: Introduction to Cardiovascular Research

- **08:30 - 09:00**: **Registration and Welcome Coffee**
- **09:00 - 09:30**: **Introduce: Seminar participants**
- **09:30 - 09:45**: **Opening Remarks -** Introduction to the goals and structure of the summer school
- **10:00-11:00**:**Session: Basis for Cardiovascular (patho)physiology** (Heart anatomy, blood flow, electrical activity, and the role of vascular systems)
- **11:15 – 12: 30 Keynote Lecture 1: Cardioprotection and novel therapeutics strategies**
  Introduction to major cardiovascular diseases such myocardial infarction, stroke, and/or hypertension
- **12:30 - 13:30**: **Lunch Break**
- **13:30 - 17:30**: **Workshop: Animal Welfare and Introduction to Cardiovascular Research Methods I.**
-
  (3R, Knowing the anatomy of a human-sized heart, including chambers, valves, and major vessels, and conducting experiments using O2k technology for high-resolution respirometry in mitochondrial and cellular research, with emphasis on basic data collection and interpretation)
- **18:00 - 19:00**: **Evening Reception**

Day 2: Disease Mechanisms & Risk Factors

- **08:00 - 08:30**: **Morning Coffee & Recap**

- **08:30 - 9:30**: **Keynote Lecture 2. Coronary Artery Disease and Microvascular Dysfunction**
  (pathophysiology, models and novel treatments)
- **9:45 - 10:45**: Keynote Lecture 3. **Session: State of the-art- Molecular and Cellular Techniques in Cardiovascular Research & Cardiovascular Proteomics**
- **11:00 - 12:00**: Keynote Lecture 4. **Session: Vascular dysfunction and inflammation** (atherosclerosis, platelets biology, vascular inflammation and novel (non)-pharmacological therapeutics)

- **12:30 - 13:00**: **Lunch Break**
- **13:00 - 16:00**: **Workshop: Cardiac and vascular physiology and Vascular function assessment** (Designing, collecting and interpreting hemodynamic measurements, wire myography, coronary vascular function)
- **16:15 - 17:45 - The role of genetic and epigenetic factors as drivers of cardiometabolic syndromes**
- **18:30 - 22:00**: **Evening Networking Dinner**

Day 3: Emerging Technologies in Cardiovascular Research

- **09:00 - 09:30**: **Morning Coffee & Recap**
- **09:30 – 10:30**: **Lecture: Cardiovascular Imaging Techniques**
  (Echocardiography, MRI, CT, and PET in cardiovascular research and diagnosis)
- **11:00 - 12:30**: **Lecture: Heart Failure: Mechanisms and Therapeutic Strategies**
- **12:30 - 13:30**: **Lunch Break**
- **13:30 - 18:00**: **Workshop: Hands-on animal models in cardiovascular research** (myocardial infarction and hypertrophic cardiomyopathy and echocardiography), including cardiac fibroblast isolation, cell culture, and staining techniques for detecting fibrosis in tissues and cells.

Day 4: Tissue Engineering in Cardiovascular Research

- **08:00 - 08:30**: **Morning Coffee & Recap**
- **08:30 - 10:00**: Keynote **Lecture 5: Tissue engineering in Translational Cardiovascular Research –**
- **10:15 - 11:00 Session: Vascular engineering**
- **11:15 - 12::30 Session: 3D Bio printing**

- **12:30 - 13:30**: **Lunch Break**
- **13:30 - 17:30**: **Hands-on: 3D Bio printing/Bioreactor Technology**
- **17:30 - 18:00**: **Q&A and Networking Session**

Day 5: Future Directions in Cardiovascular Research and Closing

- **09:00 - 09:30**: **Morning Coffee & Recap**
- **09:30 - 10:30**: Keynote **Lecture 6: Artificial Intelligence in Cardiovascular Medicine** (Machine learning in diagnostics, predictive modelling)
- **11:00 - 12:00**: **Session: The Future of Cardiovascular, Devices & Innovations**
  (Wearable technology, AI in diagnosis, and cutting-edge medical devices)
- **12:15 – 13:00**: **Wrap-up Session: Key Takeaways & Future Research Directions**
  (Summary of the week, participants share insights and next steps)
- **13:30**: **Closing Remarks and Certification Ceremony**

This schedule is designed to provide participants with a comprehensive experience, from foundational knowledge to the latest innovations in cardiovascular research. It balances lectures, hands-on activities, and networking opportunities to ensure a well-rounded educational experience.

Course Fee: €950 (includes registration fee, lunch, morning coffee, dinner (1x), and visiting tour at the Josephium).

Contact:
biomedizin-forschung@meduniwien.ac.at; attila.kiss@meduniwien.ac.at

Course coordinators/Founders:

Univ.Prof. Dr. Dr.hc Bruno K Podesser, MBA
Ap.Prof. Dr Attila Kiss

International Faculty